

colony at Lack Creek suggests that some peculiar set of circumstances has influenced this vegetation in the past.

Three of the Shasta-Tehama cypress groves are closely associated with *Pinus attenuata* populations. Two other groves are not far from *P. attenuata* areas. Several ecological similarities between these two different fire-adapted conifers are apparent. The historical events that have contributed to the widely scattered distribution of *P. attenuata* probably have also influenced the distribution of MacNab cypress. The pine, however, has a broader range of ecological tolerances. Its range closely approximates the combined range of the three cypresses mentioned here: *C. macnabiana*, *C. sargentii*, and *C. bakeri*.

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LITERATURE CITED

- GANKIN, R. and J. MAJOR. 1964. *Arctostaphylos myrtifolia*, its biology and relationship to the problem of endemism. *Ecology* 45:792-808.
- JEPSON, W. L. 1909. A flora of California. Vol. 1. Associated Students Store, Berkeley.
- JEPSON, W. L. 1931. Open letter on *Cupressus macnabiana*. *Madroño* 2:31.
- McMILLAN, C. 1956. The edaphic restriction of *Cupressus* and *Pinus* in the Coast Ranges of central California. *Ecological Monographs* 26:177-212.
- SARGENT, C. S. 1922. Manual of the trees of North America.. Houghton Mifflin Co., Boston and New York.
- STONE, C. O. 1965. Modoc cypress, *Cupressus bakerii*, does occur in Modoc County. *Aliso* 6:77-87.
- SUDWORTH, G. B. 1908. Forest trees of the Pacific slope. U.S. Dept. Agr., Forest Service.
- WIESLANDER, A. E. 1928. (Note on *Cupressus macnabiana*). *Madroño* 1:186.
- WOLF, C. B. 1948. Taxonomic and distributional studies of the New World cypresses. *Aliso* 1:1-250.

A NEW SPECIES OF PRIMROSE FROM NEVADA

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Primula nevadensis N. Holmgren, sp. nov. Folia erecta, scapos plerumque superantes, oblanceolata vel lineari-oblanceolata, (2.5)-5-10-(12) cm longa, 0.6-1-(1.5) cm lata, distaliter grosse dentata vel enterdum subtiliter dentata vel etiam integra, ad apicem obtusa vel

acuta, raro rotundata; scapa 3.5–9–(11) cm alta, pauciflora, bracteis involucri (3)–4–8–(11) mm longis; flores heterostyli, calyce 6–10 mm longo, tubo lobos superanti, corolla lobis violaceis patentibus emarginatis, tubo in flore brachystylo (7)–8–10–(11) mm longo, limbo (4)–6–10–(11) mm lato, tubo in flore dolichostylo (6)–7–9–(10) mm longo, limbo (5)–7–11–(12) mm lato.

Herbage minutely glandular puberulent; leaves erect, usually surpassing the scapes, oblanceolate to linear oblanceolate, gradually tapering into a winged petiole, (2.5)–5–10–(12) cm long, 0.6–1–(1.5) cm wide, coarsely toothed beyond the broadest point to sometimes entire, obtuse or acute, rarely rounded at apex; scapes 3.5–9–(11) cm high, bearing an umbel of (1)–2–3–(8) flowers; involucre bracts as many as the flowers and opposite the pedicels, the largest one (3)–4–8–(11) mm long, lanceolate, the smallest rudimentary and up to 3 mm long, triangular to lanceolate; pedicels 5–15–(23) mm long; calyx pale green and densely farinose, especially in a rhomboid patch below each cleft, to purplish and scarcely farinose, tube (3.5)–4–7–(8) mm long, the teeth 2–4 mm long, triangular; corolla purple in bud, lobes violet at anthesis with a dark purple ring around the throat, throat yellow to yellow-orange inside, yellow or brown with a violet tinge outside, tube yellow to white; flowers heterostylous, the measurements of the tube and limb varying accordingly, the lobes alike in all flowers; in thrum flowers (anthers above the stigma), tube (7)–8–10–(11) mm long, limb (4)–6–10–(11) mm wide, in pin flowers (anthers below the stigma), tube (6)–7–9–(10) mm long, limb (5)–7–11–(12) mm wide; corolla lobes (4)–5–9–(10) mm long and (3)–5–8–(10) mm broad, emarginate to obcordate; anthers yellow to yellow orange, about 2 mm long; pollen grains tetrahedral with convex walls, measurements in pin flowers about 15.6μ and in thrum flowers about 21.8μ ; capsules 5–6 mm long, 4 mm thick, elliptical, within a persistent and slightly accrescent calyx.

Type. *Holmgren, Reveal & LaFrance 2216*, south slope of Mt. Washington, Snake Range, White Pine Co., Nevada, at about 11,500 feet elevation, July 20, 1965 (NY-holotype, 34 isotypes distributed).

Additional specimens. Nevada. Nye Co.: Troy Preak, Grant Range, *Worth & Priest 601* (NY); *Holmgren, Reveal & La France 2213* (34 sheets distributed). White Pine Co.: Mt. Washington, Snake Range, *Holmgren & Reveal 1653* (14 sheets distributed); Snake Range, Lincoln Peak, *Holmgren, Reveal, & LaFrance 2219* (35 sheets distributed).

Primula nevadensis is known from only the Grant Range and the Snake Range of east central Nevada, where it seems to be restricted to limestone outcrops at elevations above 11,000 feet. Similar habitats exist in the two intervening ranges, the Egan and Schell Creek ranges, and also in two other nearby ranges, the White Pine Range just north of the Grant Range and the Mt. Moriah region of the northern Snake Range. With the assistance of James L. Reveal and Charles LaFrance, we explored these areas and failed to find it.

In its known localities *P. nevadensis* is very common in crevices of limestone rock and on open gravelly slopes and ridges with scattered *Pinus aristata* Engelm., *Ribes montigenum* McClat., *Eriogonum holmgrenii* Reveal, *Phlox hoodii* Richards., *Aquilegia caerulea* James, *Castilleja nana* Eastw. and krumholz of *Picea engelmannii* Engelm.

The nearest relatives of *P. nevadensis* are *P. cusickiana* Gray, *P. maguirei* L. Williams and *P. angustifolia* Torr. These four species are the New World representatives of the section *Nivales* Pax. *Primula nevadensis* is probably more closely allied to *P. maguirei* and *P. cusickiana* than to *P. angustifolia*. The distinguishing characteristics are shown in the following key:

- Inflorescence with 1, rarely 2 or 3 flowers; bracts 1.5-3-(4) mm long; alpine areas of the southern Rocky Mts. *P. angustifolia*
 Inflorescence usually with more than 1 flower; bracts mostly 3-9 mm long.
 Corolla tube 1.5-2 times as long as the calyx; leaves (7)-10-25 mm wide; calciphile; known only from Logan Canyon of the Bear River Range in northern Utah, at lower elevations. *P. maguirei*
 Corolla tube 1-1.5 times as long as the calyx; leaves 4-10-(15) mm wide.
 Scape longer than the spreading leaves; leaves mostly 2.5-5 cm long; foothills and montaine slopes in central Idaho and northeastern Oregon, below timberline. *P. cusickiana*
 Scape usually overtopped by the erect leaves; leaves mostly 5-10 cm long; calciphile; alpine areas of east central Nevada. *P. nevadensis*

Our discovery of this plant was not entirely by accident. Both James L. Reveal and I had heard independently of an undescribed primrose from eastern Nevada. So while collecting in the Snake Range in the summer of 1964 we were both consciously looking for it, but after a week of collecting on the quartzite and granite slopes of Wheeler Peak and upper Snake Creek drainage we had given it up as not being a Snake Range inhabitant. Because of this it came as a real thrill when we stumbled across it a few days later on the limestone slopes of Mt. Washington only a couple of miles south of Snake Creek.

That winter in the New York Botanical Garden herbarium I discovered a C. R. Worth & Amel Priest collection in the unidentified primroses. Worth responded to my inquiry with a letter giving me the history of its discovery in the Grant Range. In the summer of 1945 Rogers McVaugh showed him a specimen he had collected on Troy Peak, which Worth recognized as being distinct from anything he knew. He collected it himself in 1947 and again in 1958. He sent a specimen to William Wright Smith at Edinburgh who did not want to commit himself without more material to study from. To my knowledge these are the only collections of it prior to my own.

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